

# Be Aware of Depth Hoar



Submitted by Doug Chabot on Tue, 04/15/2014 - 12:43

## Powder Magazine

Winter is in the rearview mirror and spring is gaining momentum but we cannot forget about avalanches. As the seasons change so do the types of avalanches. There are two ways to trigger avalanches: stress the snowpack or weaken it. Dry slab avalanches are common in winter and occur when too much weight (stress) is added to the snowpack. Under a heavy load of new snow, windblown snow or skiers, layers collapse and avalanche from this added stress. In spring the snowpack loses strength and weakens when melting water breaks down snow crystals and provides lubrication between layers. Some types of layers are more prone to this type of weakening and this season the western US has one of the worst: depth hoar.

Depth hoar are large grains of sugary snow found near the ground that do not bond strongly to each other. A snowball cannot be made with a fistful of these grains because they just fall out of your palm like sand. Although much of the west had historically low snowfall, depth hoar still formed at the ground and was capped with seasonal snow, albeit a meager amount in some areas. In fact, these crystals form very quickly in thin snowpacks. Even mountain ranges with higher than average snowfall experienced the growth of these crystals during a fierce December cold snap when the snowpack was still young and not deep.

This spring, these faceted grains are the primary weak layer that can result in destructive wet slab avalanches. Sunny days are “solar storms” that when coupled with above freezing nighttime temperatures will raise the avalanche danger quickly. Typically, 48-72 hours of warm conditions will ripen the snowpack for wet slabs. Once water begins to flow it weakens the internal structure of the snowpack, and when liquid reaches depth hoar crystals they will crumble and avalanche rapidly.

Water flowing for a week or more will find paths of least resistance and create channels. These channels act as pipes which flush the water out of the snowpack with only a minimal reduction in strength. The days before these channels form are the most dangerous because the entire snowpack is moist, weak and primed to avalanche. Stepping out of our skis and sinking to the ground is a sign the wet snow does not have enough strength to support us. Sinking deeply is a warning to stay out of avalanche terrain. If temperatures plummet and the snow refreezes, then the opposite is true: it is solid and stable as a rock. We need to be mindful of air temperatures, especially at night, and to be cautious on the spring’s first days of round-the-clock above freezing temperatures. Depth hoar was a problem all winter and it will remain a big one throughout spring.

*Doug Chabot, director of the Gallatin National Forest Avalanche Center based in Bozeman, Montana.*

Video Links:

<http://youtu.be/2cResiPy50U>

<http://youtu.be/e3JkJU9I2Vw>